

**CALIFORNIA STATE VEHICLE
FLEET FUEL EFFICIENCY
REPORT: VOLUME I
SUMMARY OF FINDINGS AND
RECOMMENDATIONS**

**CALIFORNIA
ENERGY
COMMISSION**

**CALIFORNIA
AIR RESOURCE
BOARD**

**CALIFORNIA
DEPT. OF
GENERAL
SERVICES**

COMMISSION REPORT

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Introduction and Background

California is a leader in the development and use of alternative fuels and advanced vehicle technologies. To continue this leadership, state government should operate its own fleet of passenger cars and light-duty trucks using the most efficient fuels possible in vehicles with the most advanced technologies.

To this end, in 2001, Senate Bill 1170 directed three agencies to examine strategies to reduce petroleum consumption and introduce cleaner vehicles in the state fleet (Senate Bill 1170 (SB 1170), Sher, Chapter 912, Statutes 2001). These agencies are the California Energy Commission (Energy Commission), California Air Resources Board (CARB), and Department of General Services (DGS).

SB 1170 specifically required the Energy Commission, CARB, and DGS to address the following:

- Examine purchasing patterns for the state's fleet of motor vehicles
- Analyze costs and benefits associated with reducing energy consumption of the state vehicle fleet by no less than 10 percent on or before January 1, 2005
- Develop and adopt fuel-efficiency specifications governing the purchase of state vehicles that, on an annual basis, will reduce petroleum consumption to the maximum extent practicable and cost-effective
- Develop and adopt a policy for purchasing light-duty fleet vehicles that meet or exceed CARB's ultra low emission vehicle (ULEV) standard

The legislation further requires the state to pursue a waiver from the federal requirements on the purchasing of passenger cars and light-duty trucks if the report demonstrates that the state can reduce petroleum from its fleet at a lower cost but with equivalent emission reductions.

SB 1170 did not direct the agencies to address medium and heavy-duty vehicles; as a result, the "Greening the Fleet" at the Department of Transportation (Caltrans) is not addressed in this report. The Greening the Fleet Program is an effort to introduce clean fuels and technologies in its heavy-duty vehicle fleet.

This report is submitted in two volumes. Volume I, developed by the Energy Commission, CARB, and DGS, summarizes the major findings and recommendations regarding options to reduce petroleum fuel consumption and improve emission characteristics within the state fleet. Volume II, the Consultant Reportⁱ, contains the technical analyses on which the findings and recommendations are based.

Related State Efforts

Several other related efforts are underway that cover the subject of this report:

- Assembly Bill 2076 requires the Energy Commission and CARB to develop and submit a plan to the Legislature to reduce petroleum dependence in California (AB 2076, Shelley, Chapter 936, Statutes of 2000). This plan provides a policy framework to reduce petroleum consumption in the state fleet and will be the foundation of the state's transportation energy policy.
- SB 1170 also required the Energy Commission to develop and adopt recommendations for the Governor and the Legislature regarding a state fuel-efficient tire program.ⁱⁱ This program includes expanding data collection, developing a tire efficiency information program, and developing and disseminating consumer information on tires.
- The Driving Green Task Force (DGTF) is a collaboration within state government to "Green the State's Fleets." Lead by the State and Consumer Services Agency, it involves 25 state agencies that operate fleet vehicles. This task force is addressing many of the topics in SB 1170 and could serve as a policy and planning mechanism to implement many of the SB 1170 report recommendations.
- The Joint Agency Climate Team (JACT) is a group of more than 15 state agencies chaired by the California Resources Agency. This group develops policy and program initiatives to reduce greenhouse gas emissions. One initiative, the "Clean Transportation Initiative" focuses on efficiency as a key component to reducing greenhouse gas emissions through better fuel economy and reducing vehicle miles traveled. The JACT has also provided comments on policies and programs being formed on the federal, state, and local levels.
- The State Equipment Council (Council) is a group of nine state agencies that manage the largest vehicle fleets. The Council was established to advise the Director of DGS on automotive and heavy equipment policies, to secure maximum utilization of state equipment, and to disseminate information among state agencies.
- The Energy Policy Advisory Committee (EPAC) is a group of program managers from the nine largest energy consuming state institutions and departments. The EPAC coordinates energy and water conservation projects in their respective departments, identifies barriers, and suggests solutions and corrective actions to further conservation investment opportunities.

California State Vehicle Fleet

California's vehicle fleet is one of the largest public fleets in the world. State agencies, which include the University of California campuses and state universities, operate nearly 73,000 vehicles, using approximately 46 million gallons of gasoline and nine million gallons of diesel fuel per year.

The purchase of state vehicles is subject to the federal Energy Policy Act (EPACT). The EPACT, signed into law on October 24, 1992 requires that 75 percent of non-exempt light-duty fleet purchases be alternative fuel vehicles (AFVs). The intent of this legislation is to displace 10 percent of petroleum fuels by the year 2000, and 30 percent by 2010.

Exempt vehicles are used in specialized applications such as law enforcement, emergency response, vehicles that are medium- and heavy-duty, and vehicles listed as “others.” All other state purchases must meet EPACT fleet requirements and any state objectives.

During the last three years, the state has purchased an average of 5,100 vehicles per year. In fiscal year 2001/2002, the state purchased 4,799 vehicles; 3,675 were exempt from EPACT, while 75 percent of the 1,124 were required to be AFVs. The state exceeded its EPACT requirements by purchasing 83 percent of its non-exempt vehicles or 933 AFVs.

Table 1
Fiscal Year 2001/2002 State Vehicle Purchases

| | |
|---|--------------|
| Vehicles Subject to EPACT Fleet Rules | |
| Light duty sedans | 67 |
| Trucks and vans | 19 |
| Hybrid-electric vehicles | 113 |
| Alternative fuel vehicles | 925 |
| Subtotal | 1,124 |
| Vehicles Exempt from EPACT Fleet Rules | |
| Law Enforcement pursuit and Undercover vehicles | 1,362 |
| Light, medium and heavy duty trucks | 648 |
| Emergency Vehicles and Fire Trucks | 116 |
| Vans, buses, and heavy equipment | 616 |
| Others (Boats, motor cycles, SUVs, etc.) | 933 |
| Subtotal | 3,675 |
| TOTAL VEHICLES | 4,799 |

Source: DGS FY 2001/2002 Fleet Purchase Document

The state sets specifications on each class of vehicles in the state fleet; except for law enforcement vehicles. Specifications for law enforcement are set by the California Highway Patrol. Eventually, all specifications are put on the state bid. Through a competitive process, the DGS awards vehicles per class, usually at the lowest bid price.

The three agencies agree that it is possible to reduce petroleum consumption in the state fleet by up to 10 percent by 2005. However, in light of California’s fiscal situation, implementing these recommendations is uncertain. We outline our findings and recommendations below.

Findings

The Energy Commission, CARB, and DGS analyzed the following key topics to reduce petroleum consumption in the state fleet:

- Fuel-efficiency specifications governing state vehicle purchases,
- Alternative fuel use to displace gasoline and diesel fuel,
- High efficiency and hybrid vehicles to displace gasoline,
- The state vehicle purchase policy,
- Vehicle trip reduction and transportation alternatives,
- Data on the number and types of vehicles the state purchases,
- Vehicle maintenance practices, and
- Emission specifications governing state vehicle purchases.

These topics are discussed in detail below:

Fuel-Efficiency Specifications Governing State Vehicle Purchases

The State Administrative Manual (SAM) spells out the DGS's existing procedure to procure vehicles. The SAM, last updated in 1983, requires state vehicles to meet a minimum of 23 miles per gallon (mpg) fuel economy.

Since August 2002, the Driving Green Task Force has been investigating vehicle fuel efficiency issues and has recommended changes to the procurement procedures to include criteria that go beyond the minimum mpg and lowest vehicle capital cost. Similar to the emissions specifications for vehicle procurement which can change from the vehicle manufacturers annually, the agencies support a new procurement procedure that evaluates and scores emissions and fuel economy, in addition to the lowest capital cost when awarding the annual state vehicle procurement contract. While this is not a "specification" as requested in SB 1170, this annual review approach will result in the needed flexibility to the contract evaluation process and may result in better fuel economy and emissions improvement compared to a static specification for both of these vehicle characteristics.

Alternative Fuel Use

Bi-fuelⁱⁱⁱ Natural Gas Vehicles: The state currently owns 1,962 vehicles that can operate on both gasoline and compressed natural gas (CNG). If the state used CNG exclusively in these vehicles, it would reduce petroleum use by 2.8 percent, displacing 1.27 million gallons of gasoline per year. This information is based on an annual usage of 647 gallons of gasoline per vehicle and would provide 28 percent of the minimum reduction goal in SB 1170.

In addition to petroleum displacement, the state would achieve an annual fuel cost savings of approximately \$90,000. However, as further described below, significant investments in CNG fueling infrastructure are likely to be needed to use CNG in exclusively the state's bi-fuel vehicles.

Bi-fuel Propane Vehicles: The state currently owns 1,610 vehicles that can operate on both gasoline and propane. If the state used propane exclusively in these vehicles, it would reduce petroleum consumption by 4.4 percent, displacing approximately 2 million gallons of gasoline per year. This information is based on an annual usage of 1,257 gallons of gasoline per vehicle and would provide 44 percent of the minimum ten percent reduction goal stated in SB 1170. In addition to petroleum displacement, the state would achieve an annual fuel cost savings of approximately \$425,000.

The Caltrans fleet alone would contribute nearly half of the petroleum displacement benefits and reduced fuel costs through use of propane in the Caltrans fleet of 700^{iv} bi-fuel vehicles.

Alternative Fuel Infrastructure Expansion: The state can achieve significant petroleum displacement if AFVs were driven as often as possible on alternative fuels. The key to making this strategy work and maximizing gasoline displacement would be to expand the fueling infrastructure where state bi-fuel vehicles are located.

To date, 114 CNG fueling stations exist throughout California. Of these, 102 are publicly accessible. With respect to propane, 1506 facilities exist throughout California. Of these, 770 are publicly accessible.

Key efforts are underway to address this issue. Two CNG stations are being planned at the Los Angeles and Sacramento state garages, where many of the state's bi-fuel CNG vehicles are located. Up to 15 new propane stations are being built to support Caltrans and other state agency propane vehicle fleets and offer attractive fuel pricing. The Energy Commission has provided cost-share funding for these stations as part of the Energy Commission's Clean Fuels Infrastructure Development Plan.

Flexible Fuel Vehicles: The state currently owns 1,649 flexible fuel vehicles (FFVs^v), capable of running on E85, an alternative fuel mixture of 85 percent ethanol and 15 percent unleaded gasoline. FFVs, however, cannot currently be used in the state vehicle fleet because California lacks a retail fuel infrastructure that dispenses the alternative fuels used in the vehicle. In addition, because of their size configuration, the current manufacturers of these vehicles do not meet state fleet procurement vehicle specifications.

The DGS has adopted a new policy, effective January 2003, which eliminates FFVs as a purchase option, or any other type of alternative fueled vehicle, without corresponding fuel available in California. The existing 1,649 FFVs will be phased out of the state fleet gradually, in favor of more fuel-efficient options.

High Efficiency and Hybrid Vehicles

High Efficient Gasoline Vehicles: The state has taken an important step towards reducing petroleum consumption in the state fleet by purchasing approximately 250 more fuel-efficient gasoline vehicles. These vehicles are termed “Best-in-Class” because they have the best fuel economy in each of their respective vehicle class.

Based on the state purchasing patterns over the past three years, the state could save 33,592 gallons of gasoline annually by purchasing 254 sedans and 154 pickup trucks that are rated best in class. In 2003 dollars, the total incremental capital cost for these vehicles would be \$367,890. The fuel cost savings over the same period would be \$51,732 (depending on fuel price), effectively “buying down” the total incremental cost over two years to \$316,158.

Over the seven-year life of the vehicles, substantial additional recovery of capital costs would occur through reduced fuel costs, but the incremental capital expenditures would not be completely paid back.

Hybrid-Electric Vehicles: SB 1170 specifically requires the agencies to assess purchasing larger numbers of hybrid-electric vehicles (hybrids) as substitutes for FFVs. (Hybrids use both a gasoline engine and an electric motor.) This strategy, however, cannot be fully implemented because EPACT does not allow the state to purchase hybrids or advanced technology vehicles as an option to fulfill AFV purchase requirements.

Despite this, the state could improve the fuel efficiency of its fleet by purchasing hybrids. Currently, however, only one of the three commercially available hybrids, the 2003 Honda Civic hybrid, is on the state bid. The Honda hybrid, rated at 48 mpg, travels 30 to 60 percent more miles per gallon and consumes 19 to 38 percent less gasoline per mile compared to a similarly equipped 30 to 37 mpg conventional vehicle purchased by the state. In contrast to a similar conventional vehicle hybrids cost about \$5,500 more at current production levels primarily due to the incremental cost of the hybrid system. However, a significant portion of the cost is because hybrids are only available in limited models that include more options.

Hybrids are advanced technology vehicles that provide very significant short-, mid-, and long-term fuel economy benefits to the state. Hybrids reduce petroleum use, provide very low emissions, and serve as an important transition to the commercial introduction of fuel cell vehicles.

Within the constraints of EPACT requirements, past purchasing trends indicate that the state can purchase approximately 254 hybrids over the next two years. If these were phased-in from mid 2003 to late 2004, the state could save 47,625^{vi} gallons of gasoline, compared to purchasing conventional sedans rated at 30 mpg. The total incremental capital cost for the hybrid vehicles in 2003 dollars would be \$1,389,380. The fuel cost savings over the same period would be \$73,500 (depending on fuel price), reducing the total incremental cost over two years to \$1,315,880.

To date, the state has purchased more than 200 hybrids, which a growing number of automobile companies are now offering.

Over the seven-year life of the vehicles, substantial recovery of costs would occur through reduced fuel costs, but the incremental capital expenditures would not be completely paid back. Despite dramatic fuel economy improvements, hybrids represent a very modest reduction in the state fleet's petroleum consumption, because of the small number of hybrids that can be purchased under current EPACT fleet requirements. The costs of hybrids will be reduced when additional manufacturers offer hybrids.

The State Vehicle Purchase Policy

State Vehicle Purchase Policy: Current state purchase policy effectively limits options for state agencies by requiring lowest bid and awarding a single vehicle contract per class. This policy makes it very difficult to purchase hybrids or "best-in-class" conventional vehicles routinely, because these vehicles generally have higher capital costs than typical vehicles procured but may have lower life-cycle costs.

Up until January 2003, the state practice allowed exemptions for certain vehicles used in specialized applications, such as law enforcement, emergency response, and others.

Federal Energy Policy Act: The EPACT has the single largest influence on the types of vehicles that the state can purchase in "non-exempt" categories (essentially light-duty vehicles used in non-emergency applications). To meet EPACT requirements and state objectives, more than 75 percent of the light-duty vehicles purchased have been alternative fuel vehicles AFVs. However, EPACT has done little to help the state reduce petroleum fuel consumption as these AFVs are not currently required to use an alternative fuel, even when it is available.

In addition, as noted above, the current EPACT fleet requirements do not provide AFV credits for purchasing either hybrid or more fuel efficient conventional gasoline vehicles.

State Vehicle Fleet Reduction: More information is required to determine if downsizing the number of state vehicles will reduce petroleum use.

The DGS Office of Fleet Administration (OFA) oversees use of the fleet's pool vehicles. The OFA recognizes that significant opportunities exist to reduce petroleum consumption through better matching of vehicle types with employees' travel needs. For example, greater fuel efficiency for the fleet can be gained by assigning front-wheel drive sedans or 2WD pick-up trucks instead of 4WD or Sport Utility Vehicles (SUV).

The DGS sent surveys to state agencies to solicit input regarding fleet operations and potential fleet reduction. Due to the limited number of agency responses, the data was insufficient to form an adequate assessment.

Caltrans has begun eliminating SUVs and vehicles from its fleet and phasing in hybrid vehicles.^{vii} Similarly, assigning hybrids, AFVs, smaller vehicles, or more fuel-efficient vehicles instead of larger less efficient vehicles will reduce petroleum fuel use.

The OFA has started the initial process to assess ways to allocate vehicles in the DGS fleet more selectively. Also, modest but measurable reductions in the fuel consumption of the state fleet may be obtained through driver training fuel-efficient driving techniques.

Vehicle Trip Reduction and Transportation Alternatives

Vehicle Trip Reduction: If it adopted improved procedures, the state could reduce vehicle trips of its employees, thereby reducing petroleum consumption and ensuring the most efficient transportation choices for state business.

Flexible work options such as telecommuting, teleconferencing, and videoconferencing will reduce petroleum consumption. Telecommuting and other types of electronic communications have potential to reduce state fleet vehicle miles traveled to the extent that a trip involves state vehicles.

Transportation Alternatives: If the state adopted enhanced ridesharing and public transportation programs, it would reduce fleet VMT, provided that trips involve state vehicles. State agencies have planned or implemented a variety of related programs to help reduce petroleum fuel consumption in the fleet. These efforts reduce VMT and promote conservation ethics in the general public, as well as to state employees.

The DGS's website provides a link to the "Smart-Traveler" website, which provides information on alternative modes of transportation and public transit options.

Data Collection

Data Collection: In preparing this study, the three agencies were limited by insufficient data and information regarding the nearly 73,000 state fleet vehicles and approximately 120 agencies. This lack of data makes it possible to estimate only the potential to reduce petroleum consumption in the state fleet and the associated costs and benefits of any focused efforts. To a significant extent, the process to gather additional information is already underway, but critical new information and data will be needed from other state agencies regarding the number and types of vehicles, their uses, and fuel consumption characteristics.

Vehicle Maintenance Practices

Vehicle Component and Maintenance Procedures: In the general population, the fuel efficiency of vehicles can be increased through optimized maintenance procedures. This practice, though, may translate to negligible or marginal benefits in fuel consumption of the state fleet, because the state mechanics generally maintain the state's vehicles, following detailed maintenance regimens.

Low Rolling Resistance Tires: A companion study *California State Fuel Efficient Tire Report* found that using "low rolling resistance" tires can help improve vehicle fuel economy. However, additional information and data are needed to assess tire wear, safety effects, costs and benefits associated with using low rolling resistance tires in the state fleet accurately.

This effort would include gathering of data on the numbers and types of vehicles operated and the types of tires used in the existing state fleet.

The Energy Commission is partnering with the Integrated Waste Management Board on this important initiative to improve the energy efficiency of after-market tires.

Emission Specifications Governing State Vehicle Purchases

The DGS has adopted effective policies governing the purchase of light-duty vehicles that meet or exceed the CARB's ULEV standard. On an annual basis, the DGS and CARB will evaluate the availability of low-emission vehicles that exceed the current standard. Currently, a limited number of vehicles have been certified to meet the CARB Super-Ultra Low Emission (SULEV) emission standard and meet the state's needs. As greater numbers of these SULEV vehicles enter the market, the DGS will adjust its vehicle procurement policy to require the state to purchase SULEVs or better. This annual review process will ensure that the state purchases the cleanest vehicles at the earliest possible time.

Recommendations

Based on the findings above, the Energy Commission, CARB, and DGS recommend the following strategies to reduce petroleum use in the state fleet:

- Adopt procedures for annual evaluation of fuel economy,
- Use alternative fuels in bi-fuel natural gas and propane vehicles,
- Purchase high efficiency and hybrid vehicles,
- Seek purchase policy changes,
- Reduce vehicle trips and use alternative means of transportation,
- Expand data collection, and
- Practice proper vehicle maintenance and evaluate use of low rolling resistance tires.

These recommendations are discussed in detail below.

Adopt Procedures for Annual Evaluation of Fuel Economy

The three agencies recommend that the DGS update the SAM with language that details the new vehicle procurement procedures, including how to evaluate and score bids to procure best-in-class vehicles for fuel economy, emissions improvement, and lowest vehicle capital cost. This procedure should include an annual evaluation of these characteristics, which the Director of the DGS will oversee in consultation with the Energy Commission, and CARB. This new procedure will result in fuel economy and emissions improvement for state vehicles and other public agencies who procure vehicles through the state contract annually.

Use Alternative Fuels in Bi-fuel Natural Gas and Propane Vehicles

Bi-Fuel Natural Gas and Propane Vehicles: We recommend that the Governor issue an executive order directing the DGS to accelerate the construction of propane and compressed natural gas fueling facilities at large state garages, and maintenance facilities. In addition, the executive order should mandate that these vehicles are fueled with the alternative fuel when available.

As a certified low emission alternative fuel and an EPACT certified fuel, propane should be used in state vehicles whenever available. Propane as a transportation fuel meets the core objectives of SB 1170, consistent with its intent. This measure may be essential to meet the challenging targets under SB 1170 for displacing petroleum fuels, especially in the case of the state's numerous bi-fuel vehicles, as these vehicles are currently operated almost exclusively on gasoline.

The Caltrans fleet alone would contribute nearly half of the petroleum displacement benefits and reduced fuel costs through using propane in the Caltrans fleet of 700^{iv} bi-fuel vehicles.

Alternative Fuel Vehicle Infrastructure Expansion: We recommend that the state expand its existing CNG and propane fueling infrastructure to achieve fuel displacement.

Although California has made significant progress, new initiatives are needed to expand the CNG fueling infrastructure in key areas such as the state garages and maintenance facilities. Additional initiatives are needed to motivate agencies and employees to use alternative fuel vehicles and alternative fuels to the maximum extent possible.

To best manage costs, the state may need to provide cost-share funding and/or land for some (or all) of the stations. One approach would be to contract with a third-party "turnkey" alternative fuel provider. Additionally, public/private-partnerships should be encouraged to maximize fuel throughput at each station.

Purchase High Efficiency and Hybrid Vehicles

High Efficiency and Hybrid Vehicles: The state should purchase more energy efficient, environmentally sound technologies such as high efficiency gasoline and hybrid vehicles. At present, the state will not be paid back the incremental costs in fuel cost savings, but the incremental costs will be reduced when more manufacturers offer hybrids. This strategy can ultimately result in important longer-term gains.

Seek Purchase Policy Changes

State Vehicle Procurement: We recommend that DGS review the current criteria for granting exemptions to the policy that requires purchased vehicles to meet the ULEV standard, or better.

The DGS Procurement Division will work with the OFA to facilitate "one-time" contracting for hybrid electric vehicles. We expect that many, new hybrid models will become available

outside the normal state bid cycle. This recommendation will result in the earliest possible introduction of hybrids into the state fleet.

Currently, local agencies purchase vehicles off the state bid list. We recommend that the DGS Procurement Division remove those vehicles from the state bid that do not meet the state policy, thereby encouraging the state to purchase the cleanest and most fuel-efficient vehicles available.

Internal Vehicle Purchase Policies: We recommend a “multiple awards process” as one option for incorporating a combination of important vehicle attributes (efficiency, emissions, life-cycle costs, cargo or passenger capacity, etc.). Special “green” vehicle points will be considered for those options that offer the state the most potential to meet both short- and long-term energy efficiency objectives, as identified in SB 1170 and AB 2076, respectively.

We recommend replacing 4 wheel drive and SUVs with more fuel efficient front-wheel drive sedans or pick-up trucks. As a matter of policy, state should discourage agencies from purchasing SUVs, unless they document a critical need. To complement this, the DGS should develop guiding principles that govern purchasing SUVs.

Federal Energy Policy Act: The EPACT should be amended to allow a broader interpretation of eligible vehicles, including the use of hybrids to fulfill EPACT fleet requirements.

By amending EPACT to include high efficiency and hybrid vehicles, the state would be able to purchase hundreds of additional hybrids per year as alternatives to non-dedicated AFVs. This strategy could provide per-vehicle reductions in gasoline usage of approximately 50 percent and deliver significant savings in fuel economy within the state fleet.

Therefore, we recommend that the State of California actively pursue modifications to the EPACT to include hybrid electric and “other fuel efficient vehicles” to reduce petroleum consumption significantly in the state fleet.

Fuel-Efficient Allocation and Use of Vehicles: We also recommend that the DGS continue and expand efforts to evaluate the location of all pool vehicles and their current uses. This measure will include assessing the new procedures and mechanisms that may be needed to select the right vehicles for the uses most often requested. The DGS will prepare and circulate information to state employees about techniques to drive vehicles more efficiently, the use of alternative fuels, and the importance of reducing fuel consumption in the state fleet.

State Vehicle Fleet Reduction: The State of California should examine the best-available scenarios for cutbacks in capital and operational budgets of fleets, and how this fiscal situation will affect vehicle operations and petroleum consumption.

As part of the survey previously noted, the DGS will request detailed information from each agency that operates at least 15 state vehicles, including rosters of all vehicles, their ages and specifications, frequency of use and types of applications, real-world fuel economy, and volumes of fuel used per year.

As a means to reduce petroleum consumption in the state fleet, any vehicles that are obvious candidates for early retirement and no longer serve a “mission-critical” purpose will be removed from the fleet, without being replaced, and sold at auction.

On February 4, 2003, the DGS was directed to ban all state vehicle purchases for non-emergency use and ordered to idle 600 vehicles in the DGS fleet. This directive still needs to be analyzed to determine the effect on fuel consumption.

Reduce Vehicle Trips and Use Alternative Means of Transportation

Vehicle Trip Reduction: Programs such as flexible work options, telecommuting, teleconferencing, and videoconferencing should be initiated whenever possible because they could provide benefits at relatively low cost. More information is needed to assess the costs and potential benefits associated with these programs.

Currently, all state agencies and departments must reduce in-state travel by a minimum of 35 percent for the remainder of the current budget year. This effort will have a positive impact on vehicle trip reduction.

Transportation Alternatives: Ridesharing and public transportation should be used whenever practical to reduce fleet VMT, provided that trips involve state vehicles. State agencies should implement a variety of related programs to help reduce petroleum fuel consumption in the fleet.

State employees should use the “Smart-Traveler,” which is a link from the DGS website to research the most cost-effective alternative transportation modes and public transit options prior to state or personal travel.

Expand Data Collection

Data Collection: We recommend that the DGS expand its data collection on state fleet operations and vehicle fuel consumption.

Currently, data collection on the state fleet is difficult and incomplete because of the many different fleet data gathering systems used by state agencies. For the DGS to obtain more detailed data, a web-based statewide fleet data collection system needs to be developed. The new collection system will enable state agencies to submit more detailed data about their fleet operations, including vehicle numbers, usage, fuel types and fuel quantity used. The data would be entered electronically on the OFA’s website. These data will also be used for annual reports required by the federal government and the SB 1170 annual report to the Legislature.

The success of the new program will depend on receiving management commitments from all agencies to provide accurate fleet statistical data on a timely basis.

Practice Proper Vehicle Maintenance and Evaluate Use of Low Rolling Resistance Tires

Vehicle Component and Maintenance Procedures: We recommend that the DGS work with the Statewide Equipment Council and the Driving Green Task Force to review procedures, frequency of maintenance, and potential opportunities to improve key maintenance-related activities. This measure may involve maintaining proper tire pressure, balancing and rotating tires, changing of air and oil filters, and front-end alignment.

The DGTF is also working with the Integrated Waste Management Board and the Department of Toxic Substances Control to expand the number of state maintenance and repair facilities as part of the model garage program.

Low Rolling Resistance Tires: The three agencies recommend that the state evaluate the use, when available, of low rolling resistance tires, to improve fuel economy of its existing fleet.

The DGS should be included in any tire program, so that appropriate rolling resistance criteria can be designed to assist them in procuring tires for the state fleet.

The three agencies also recommend that the DGS explore ways to collect information on the low rolling resistance of tires from auto and tire manufacturers, as part of their tire purchasing specifications.

The following activities are also currently underway:

- The DGS is developing a tire education and data collection program specific to state fleets with \$100,000 they received from Integrated Waste Management Board. This program includes education, outreach, and tire specification activities.
- The Integrated Waste Management Board may allocate \$200,000 per year, for two years, to the Energy Commission to embark on a tire testing program which includes the evaluation of energy saving benefits of low rolling resistance tires and the effect on safety and expected tire life.

Conclusion

This report recognizes the importance of fostering partnerships with other federal, state, and local agencies to pass along the benefits identified in the SB 1170 report. We recommend that the Energy Commission, DGS, and the CARB work with other agencies to explore partnership opportunities, including information sharing and co-funding of vehicle purchases and alternative fuels infrastructure. In this way, these agencies can develop synergy by working together to reduce petroleum consumption in all levels of government fleet operations.

Table 2
Summary of Measures for Implementation by January 2005

| Potential Measure to Reduce Petroleum Consumption in Fleet by January 2005 | Estimated Annual Gasoline Displacement | Percent Reduction in Gasoline Use for State Fleet | Estimated Incremental Costs (2003 \$) | Estimated Savings in Fuel Costs (2003 \$)* | Actions Needed to Overcome Issues or Barriers |
|---|--|---|---|--|--|
| Operate State fleet's 1,610 bi-fuel LPG vehicles 100% on LPG | 2,023,770 gallons | 4.4% | Vehicles: no new costs Infrastructure: no new costs | ~\$425,000 per year for 7-yr. Life of vehicles | Executive Order requiring use of alternative fuels |
| Operate State fleet's 1,962 bi-fuel CNG vehicles 100% on CNG | 1,269,414 gallons | 2.8% | Vehicles: no new costs Infrastructure: \$3.0 to \$4.5 million for new fueling stations | ~\$90,000 per year for 7-yr. Life of vehicles | Executive Order requiring use of alternative fuels Expansion of CNG infrastructure at State garages |
| Purchase highest fuel economy cars and pickup trucks, as alternatives to currently procured vehicle types (OR) | 33,592 gallons (OR) | 0.07% to 0.10% | Vehicles: \$367,890 over two years Infrastructure: no new costs | ~\$51,732 per year for 7-yr. Life of vehicles | Possible changes in procurement policies Note: assumes 254 cars and 154 pickups will be phased in during 2003 and 2004. Subject to EPACT limits. |
| Purchase hybrid electric vehicles (HEVs), as alternatives to currently procured compact sedans | 47,625 gallons | | Vehicles: \$1,389,380 over two years** Infrastructure: no new costs | ~\$73,500 per year for 7-yr. Life of vehicles | Possible changes in procurement policies Note: assumes 254 HEVs will be phased in during 2003 and 2004. Subject to EPACT limits. |
| Various measures to reduce VMT, increase in-use vehicle efficiency, and allocate vehicles for more efficient use | 1.38 to 3.21 million gallons per year | 3% to 7% | (Insufficient information to quantify) | (Insufficient information to quantify) | Various changes in policy and procedures |
| TOTALS | 4.71 to 6.55 million gallons per year | 10% to 14%*** | | | |

* All estimates for fuel savings were based on late-2002 prices for transportation fuels. Actual fuel costs and relative savings will depend on prices that are subject to significant volatility.

** Federal incentives may apply to help offset capital costs

***The minimum target under SB 1170 is a 10% reduction (approximately 4.59 million gallons per year).

Table 3
Longer-Term Measure to Deploy Hybrid Electric Vehicles

| Measure to Displace Petroleum Fuel Over Next Several Years | Estimated Annual Gasoline Displacement | Percent Reduction in Gasoline Use for State Fleet | Estimated Incremental Costs (2003 \$) | Estimated <u>Savings</u> in Fuel Costs (2003 \$)* | Actions Needed to Overcome Issues or Barriers |
|---|--|---|---|---|--|
| Purchase ~ 1,000 HEVs each year , as alternative to currently procured compact conventional sedans and/or AFVs | 187,500 gallons | 0.4% | Vehicles: \$5,470,000 per year Infrastructure: no new costs | ~\$290,000 per year for 7-yr. Life of vehicles | Obtain amendments to federal EPACT that allow AFV credits or HEVs Note: State agencies purchase about 1,500 conventional sedans and AFVs combined, each year |
| *All estimates for fuel savings were based on late-2002 prices for transportation fuels. Actual fuel costs and relative savings will depend on prices that are subject to significant volatility. | | | | | |

ⁱ A companion report, *Volume II, California State Vehicle Fleet Fuel Efficiency Report*, written by TIAX LLC, serves as the technical basis for the proposed findings and recommendations. Recommendations for a state fuel-efficient tire program, which are required by SB 1170, are addressed in a separate Energy Commission Report.

ⁱⁱ *California State Fuel Efficient Tire Report, Volume I and II*, Publication 600-03-001F and 600-03-001

ⁱⁱⁱ Bi-fuel Vehicle – A vehicle with two separate fuel systems designed to run on either fuel, using only one fuel at-a-time. Vehicles considered are fueled by gasoline, propane or natural gas.

^{iv} The number of propane bi-fuel vehicles has increased from 700 to 1,057 during the report preparation.

^v Flexible Fuel Vehicle, a vehicle that can operate on alcohol fuels (ethanol - E85) or regular unleaded gasoline or any combination of the two from the same tank.

^{vi} Volume II, Table 5-10

^{vii} “Sure-fire cure for gas pains – take a bus,” *The Sacramento Bee*, February 24, 2003